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HUMANITARIAN AID AND RECONSTRUCTION
CASE: APRIL EARTHQUAKE 2015 IN NEPAL

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The purpose of this thesis was to have an insight on major earthquake occurred in Nepal in April of 2015, its instant impact to Nepalese citizens on social and economic bases, supports from around the globe and the possible ways of recovery.

The earthquake happened in Nepal in April 2015 which led to many Nepalese losing lives, being injured and were homeless. Numerous sympathies from international communities were received, many of them provided and assured in rescue and relief supports. The primary purpose of this thesis report was set to give the basic knowledge of earthquakes, the impact of April earthquake in Nepal, and the basic overview of national and international support. In addition, due to the many reasons behind, national and international earthquakes relief supports have not been used righteously and economically to the fields where mostly needed. This thesis targeted to find those hidden grounds of such hindrance and tried to give suggestions for a possible way out.

After finding a temporary solution, this thesis endeavored to acknowledge the need of a permanent solution to avoid possible devastation because of earthquakes in upcoming future, as Nepal is always an earthquake prone area. This approach required a very distinctive methodology and very wide and relative range of research because of the suitability on geo-economic and socio-political challenges in Nepal. Even though the resources for this thesis writing were very limited and even needed to be filtered many times in many cases for the particular purpose, it offered some useful and viable options for a safe and economic livelihood.

Key words
Humanitarian Aid and Relief, Reconstruction, Earthquake resistant housing

1 INTRODUCTION

Nepal is situated over a very hazardous geographical area where two giant Indian and Eurasian tectonic plates have been colliding thousands of kilometre underneath for millions of years. The frictional force arising from this collision is the main reason to earthquakes in the South Asian region. Recently on April 25, 2015, a 7.8 Richter scale recorded earthquake tremored and caused huge casualty and devastation in Nepal. Followed by 100s of aftershocks each day, another big earthquake measured 7.1 Richter scale recurred on May 12. On these vulnerable circumstances, many national and international governments, organizations and individuals gathered up to help Nepal with funds, relief materials and sympathies. Those volunteers were helping to release trapped victims from ruins, distributing food and water, and preparing tents for homeless. However, such process of collecting funds and building temporary shelters are not enduring solutions instead, there must be a permanent way to reside the victims in safer housing ensuring security from earthquakes. This is the motivation of this thesis which is about to discover the reliable solution of reconstruction in Nepal.

The goal of this thesis basically is to give an overview upon earthquakes occurred in Nepal in April 2015 and afterwards, its impact to the Nepalese society, aid and relief mobilization and temporary and permanent solutions. The thesis finds primary statistics of national and international fund collection purposed for earthquake aid and reconstruction. In addition, it also researches about the role of national and international humanitarian organizations in Nepal and their supply chain, ranging from donation collection to delivery. Another important content of this thesis is to understand the building methods of earthquake resistant houses as a permanent solution and roles of several internal and external parties on the implementation of governmental earthquake resistant building construction codes.

Nepal has received huge financial support from international communities purposed to earthquake victims and government of Nepal for reconstruction. Those funds are coming through different channels, some will be saved directly in governmental relief fund and some will be distributed to beneficiaries through humanitarian organizations. This thesis tries to figure out these financial supports and discovers how actually

humanitarian organizations are working in Nepal and what kind of challenges they are facing.

The significant part of the thesis is a discussion on earthquake resistant houses which are suitable in the geographical variety in Nepal. In addition with the building construction process, the thesis studies how every citizen, government and external parties can develop their roles in order to imply building codes in practical. Potential challenges and their way outs are also discoursed afterward.

This thesis is a research-based theoretical outlook made for the real and practical purpose which is immensely useful for Nepal. It is prepared with the contents extracted from related books, reliable news sources and website articles related with earthquakes in Nepal. The research is done by going through the root of existing problems, current and possible consequences and solution is concluded by understanding current economic, social and political scenarios in Nepal.

To recognise the current situation in Nepal, its impact on society and reactions from people, it was essential to take statistics, expert views and organizational activities from reliable online sources. Thus, this thesis primarily relies on the qualitative method of research. Considering the boundaries of qualitative research, it sets a limitation on validity of given information.

2 EARTHQUAKE IN NEPAL 2015

2.1 An earthquake

An earthquake is a natural phenomenon of ground shaking itself often, unnoticeably and sometimes violently. Cambridge University online dictionary defines an earthquake as "a sudden violent movement of the earth's surface, sometimes causing great damage" (Cambridge University Website, 2015). Earthquakes are mainly caused by the large tectonic plate's movement under the earth surface. There are 7 major tectonic plates and thousands of kilometres under the ground which are unstable, moving and colliding with other plates. The friction caused by movement is the major cause of earthquakes. (Geoscience Australia, 2015). Earthquakes occur around 6,000 to 8,000 times every year. Many of them cannot be noticed because of lower magnitude or being hit on the rural areas (UC Santa Barbara University of California, 2014).

The magnitude of earthquake is normally measured in Richter scale, starting from 1.0 to 10.0. An earthquake having more than 4.0 Richter can be felt and more than 6.0 can be destructive. The increment from one Richter scale to another is thirty-fold increase as per its energy release. For example, 7.0 Richter earthquake releases 30 times more energy than 6.0 Richter scale earthquake (Geoscience Australia, 2015).

2.2 April earthquake in Nepal: Reasons and consequences

On a Saturday noon of 25th April 2015, the first earthquake recorded 7.8 (7.6, according to the Department of Mine and Geology, Nepal) Richter scale hit central Nepal. The Epicentre was recorded to be the rural hilly area of Gorkha and Lamjung district. That earthquake was highly destructive for Nepal where, thousands of houses were demolished, many victims lost their lives and many other were injured. Following the major quake, thousands of other aftershocks continued for several months.

Another major aftershock, a 7.3 Richter scale recorded quake again hit eastern Nepal on May 12, 2015, at 12:35 PM (Local Time, +5:45 GMT). It also caused more houses to

collapse and took a few other lives. In total, both earthquakes claimed 8,691 lives and left 22,054 people injured until 30th of May 2015 (Earthquake Relief Portal Nepal, 2015). Experts claim that there are still higher possibilities of recurring aftershocks. Naina Bajekal for Times online magazine states that, "…the greater the size of earthquakes, the higher the numbers of aftershocks" (Bajekal, 2015). She also gives an idea that aftershocks usually continue from weeks to several months though, decreases the risks of bigger shakes.

It is not the first time Nepal has faced a destructive set of earthquakes. On January 15 1934, an 8.1 Richter scale recorded earthquake having an epicentre on Bihar, India-Nepal border had taken 10,700 people's lives aggregately in India and Nepal. Many houses in Bihar sank because of liquefied land. It caused a demolishment of houses and highly historically valued substructures in Nepal too. After the big hit, several small aftershocks continued for several months. (US Geological Survey, 2014.)

Behind these regular occurrences of earthquakes in South Asian region including Afghanistan, Pakistan, India and Nepal, there is a geographical reason. These countries are on a long fault line which is right below the Himalayan mountain range, stretching from Eastern Nepal to Afghanistan. The fault line is created by the collision of two giant Indian and Eurasian tectonic plates which has been ongoing since 40 to 50 million years. The process of plates overlapping creates a potential energy and when it is released, earthquakes occur. Earthquakes in Nepal recur following a geological clock which calculates the reappearing time is approximately 75 to 80 years. Aside from its damaging nature, Tectonic collision has given Nepal a mesmeric geographical diversity. (The Wall Street Journal, 2015.)

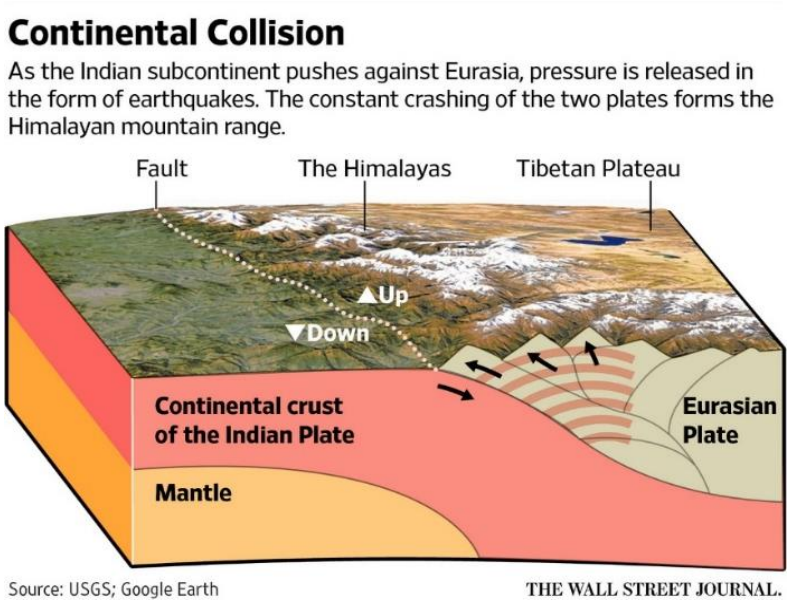

FIGURE 1. Continental collision between Indian and Eurasian Tectonic plates. *(Adapted from US Geological Survey, United States)*

The given illustration in Figure 1 shows how Indian and Eurasian Tectonic plates are overlapping and have created a fault line under the Himalayan mountain range. This is the indication of a peculiar natural phenomenon which has been undertaking under the surface.

The first big earthquake of 25th April, 2015 was massive enough to take the lives of more than 8,500 people solely in Nepal. The quake caused an avalanche on Mount Everest which also killed 19 mountaineers and many other climbers and Sherpas got injured. Rescue troops later managed to release stranded victims from Mt. Everest Basecamp (Foxnews, 2015). The April earthquake demolished almost all houses in Gorkha, Lamjung, Kabhrepalanchok and Dhading districts which are near to the epicentre. Old houses, historically valued monuments, statues and antique palaces in Kathmandu, Bhaktapur and Lalitpur districts were turned to rubble just in a moment. Many of them were recognized by UNESCO as having historical and cultural significance (Myrepublica, 2015).

FIGURE 2. The Dharahara tower before and after earthquake. *(Balkrishna Thapa Chhetri and Narendra Shrestha (EPA))*

Figure 2 is a comparison of historical Dharahara tower or Bhimsen Stambha before and after the hit of earthquake. Including this tower, other historical temples and houses which were aged and less resilient to the earthquake were destructed entirely or partially at the same day.

Because Nepal had not experienced such a big-sized earthquake for more than 80 years, people were less prepared for such an incident. Because of the high amount of casualties and destruction, people were traumatized which lasted for several months. Aftershocks followed by the major shocks were equally terrifying. Most of them were calculated to over 4 to 6 on Richter scale which gave mild tremors but, the continuous recurrence left victims frightened to enter their homes. Thus, people had to spend their nights in temporary shelters outside. It later caused a huge shortage of tents and foods which continued for several days until local volunteers and NGOs started to distribute tents, water and fast foods individually. (LA Times, 2015.)

Even in such a tragic moment, people did not lose hope and kept their patience. However, some immoral activities done by a fistful of people turned earthquake stricken people in more disappointment. Some professional thieves were caught red-handed and accused to spread rumours about coming even bigger quakes and insisting people to run outside just to burgle valuables. Police also caught some people picking ancient holy statues and metals from the ruins of temples. Those can be precious and

valued to millions of dollars in international markets (Wolfson, 2015). Taking benefits from the material shortage, some shop owners intentionally tried to raise the prices of essentials overnight. They only turned back to the normal pricelist when both people and police interfered (Straight Times, 2015).

The series of earthquakes have come up in Nepal with economic burden too. Nepal has to bear the complete liability of the whole destruction along with the restoration of victim's houses. The United States Geological Survey anticipates damages to exceed 10 billion USD (Russia Today, 2015). The valuation of damage can get even bigger because of the continuous recurrence of aftershocks.

Tourism industry in Nepal attracts more than half a million international tourists every year which generates almost 25 % of the total GDP. After earthquakes, tourists who managed to survive shortened their stay in Nepal and those who were planning to visit Nepal, cancelled their visit (Dailymail, 2015). After the massive devastation of infrastructures, national and international experts anticipate that the costs of rebuilding can reach to 5 billion USD (Al Jazeera, 2015).

3 SUPPLY CHAIN IN HUMANITARIAN PURPOSE

3.1 Supply Chain Management and Logistics

As the production and movements of goods have been mounting in this entrepreneurial world, the need and importance of effective supply chain has also propagating simultaneously. Ashish Bhatnagar explains, "a supply chain is a network of facilities and distribution options that performs the functions of procurement of materials, transformation of these materials into intermediate and finish products, and distribution of these finish products to customers" (Bhatnagar, 2009). Along with the procedural steps of supply chain, it also coordinates and collaborates with the channel partners either suppliers, intermediaries, third-party service providers or customers. In all, supply chain management is another name of integrating supply and demand across companies (Farooqui, 2010).

Logistics is taken as one of the essentials of Supply Chain Management. These days, it is a trend to produce a specific product in various different production sites and assembled in one place. Then, it is transported to another place for warehousing and finally, to end consumers. The council of Logistic Management defines logistics as, "the process of planning, implementing and controlling the efficient and effective flow and storage of goods, services, and related information from point of origin to point of consumption for the purpose of confirming the customer requirements." The definition is the brief picture of what logistics is and what it generally does. As quoted, logistics does not just take care of transporting goods from one point to another but is also responsible for the management of a whole transporting process. (Bramel & Simchi-Levi, 1997.)

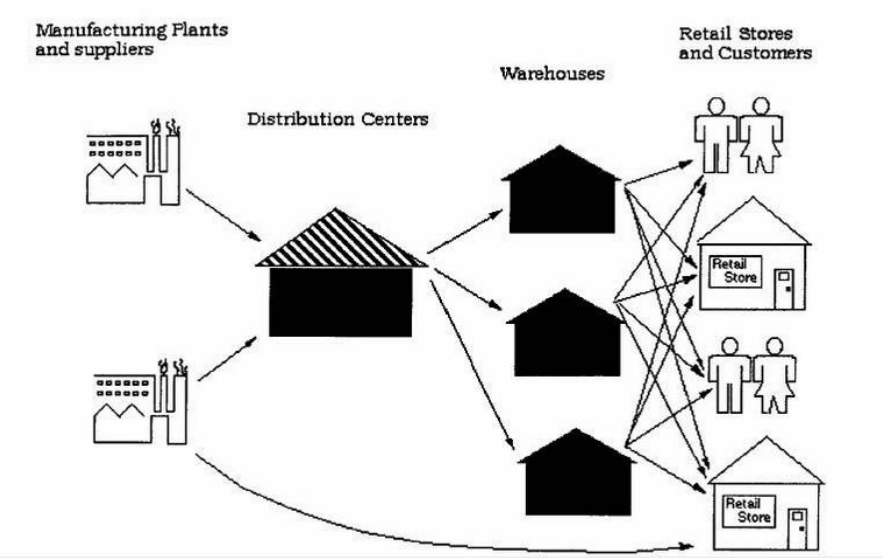

FIGURE 3. The general chain model of logistics. *(Adapted from The logic of logistics, Bramel, Julien; Simchi-Levi, David, 1997)*

Given Figure 3 is a simple representation of logistic trail. The trail begins with a manufacturing area where products are processed. Then, products are transported to a central distribution centre from where, goods are sorted and sent to the various warehouses for storage. Finally, retail stores and end-consumers get the products after dispatched from warehouses. In some cases manufacturing companies may skip middle channels for instance and can transport their ready-to-go goods directly to warehouses or to retail stores. This chain model is an easier way to understand how basically a logistics is operated.

3.2 Humanitarian Supply Chain

The earthquake in 2004 that occurred in Sumatra, Indonesia caused a tsunami in the Indian Ocean and killed 230,000 people and over 1.7 million people displaced. Over 40 nations and many other non-governmental organizations provided help to get the worst situation to be back to normal. Every year, there occurs more than 500 natural and man-made disasters leading to an average of 75,000 people to die and impacting 200 million others.

The nature of each disaster is unique based on its occurrence and features. It not only causes human casualties and infrastructural damages but, also spread the risk of poor hygiene hence, the developing epidemics. In such a critical period, victims need to be instantly evacuated, rescued, given better shelters, and ensured hygienic food and health services. These are actually the primary actions of a humanitarian organization. The purpose of humanitarian actions is to identify the condition of the catastrophe and providing specific supplies based on the concurrent need at right time. (Pan American Health Organization & World Health Organization, 2001.)

Both humanitarian and commercial supply chain function generally in similar ways of preparing, planning, procurement, transportation, and warehousing and delivery of goods to beneficiaries. Supply chain for business purpose is done with the yield expectation. Contrary to this, humanitarian supply chain is done without expecting anything from receivers. It needs to have an efficient and effective operation in a right place at the right time under a heavy budget constraint. For the effective operation, it is suggested to be led by experts who have experience in similar field. It benefits the project both from the practical knowledge and theoretical base of supply chain management.

The generic model of supply chain contains the flow of goods starting from the donations to the beneficiaries by the various steps and parties included.

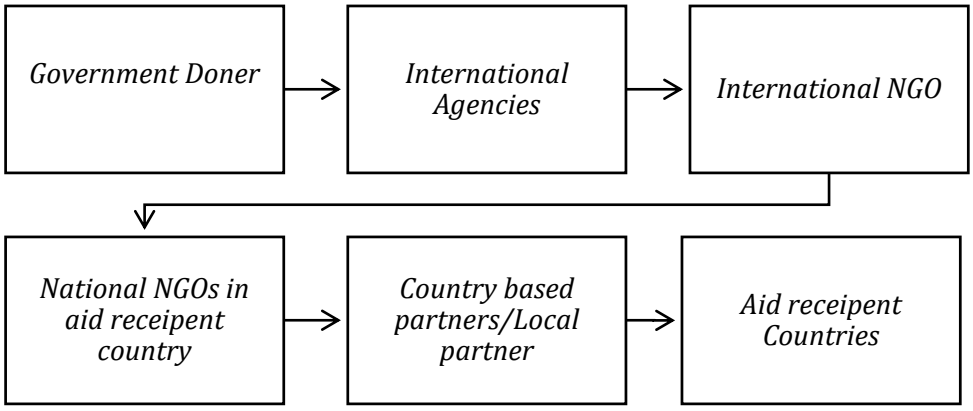

FIGURE 4. The model of humanitarian supply chain management.

Figure 4 is the general chain model showing the steps and parties participating while operating aid and relief supplies are delivered. The chain begins with budget financing where, humanitarian organizations raise funds from government and donors. The fund

passes through international channels of Non-governmental organizations (NGOs) and connects with national level NGOs of beneficiary countries. The ultimate supply wing based on recipient countries finally allocate the fund to the aid and relief beneficiaries. (Agrollo da Costa, et al., 2012.)

This is the basic supply model that humanitarian organizations generally follow for their international support activities. In the context of Nepal, international humanitarian organizations for example, Red Cross and UNICEF, have been working in the field of health, food, shelter and sanitation for many years, following similar routes of supply chain and logistics.

3.3 Supply Chain and Logistics on Humanitarian Organizations

Red Cross

Since the establishment in 1859 by a Swiss citizen Henry Dunant, the International Federation of Red Cross and the Red Crescent Societies (IFRC) are one of the world's largest humanitarian organizations. They are delivering help without a bias of nationality, race, religious beliefs, class and political opinions. They have over 60 international humanitarian operations all over the world. IFRC has a vision to inspire, encourage, facilitate and promote each and every sort of humanitarian actions in order to maintain human dignity and peace in the world. (IFRC, 2015.)

The International Federation of Red Cross and the Red Crescent Societies (IFRC) is the Gold winner of European Supply Chain Excellency Award. IFRC has provided humanitarian service for over 90 years and has achieved the global trust because of its unselfish, effective and timely accessibility in needing areas.

After the April earthquakes in Nepal, Red Cross instantly deployed its volunteers to rescue victims from ruins, provided health services for injured, and distributed foods, tents and tarpaulins to survivors. In addition to the earthquakes, Red Cross in Nepal usually participates on other disaster relief programs for landslides or flood victimized areas. Free health check-up campaign, first-aid service, orientation education for disaster safety and blood donation campaigns are the major activities of Red Cross in Nepal.

IFRC assures to store pre-positioned contingency stock including over 5,000 relief items which can serve 450,000 people at a time and ready to deliver instantly. For better management of stock, it has customized a cost-effective procurement and transportation, safe and efficient warehousing and dispatch of relief supplies. The products are ensured to be consistent, reliable and suitable for the purpose. (IFRC, 2015.)

UNICEF

United Nations International Children's Emergency Fund in brief, UNICEF is a division of United Nations and is internationally leading humanitarian and development agency working for children's rights. It has been facilitating the availability of safe shelter, health and nutrition, protection from disasters, heal and consequences of transverse life cycle for every child around the world in around 70 years (UNICEF, 2015). UNICEF has mainly been focusing on the children who are struck by epidemics and the consequences of war-based conflicts (Unicef, 2015).

The role of UNICEF in Nepal in context of April earthquake is appreciable. It has been continuously distributing relief supports to both Kathmandu valley and rural areas. When social life was messy in Nepal because of April earthquakes, UNICEF helped building temporary tents as shelters and started health checking of all victims. It vaccinated over 500,000 children against measles. Considering the risk of psychological trauma on children because of recurring aftershocks, it built playing zones for their amusement. (UNICEF, 2015.)

In all areas of actions, UNICEF follows specific supply chain for timely and effective accomplishment. The flow of its supply chain actions are illustrated below:

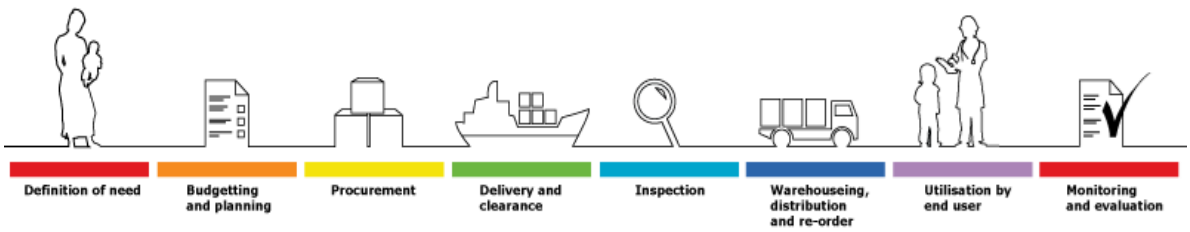

FIGURE 5. The supply chain flow of UNICEF. *(Adapted from Supply and Logistics, website of UNICEF)*

a. Definition of Need: UNICEF works with governments and determines what sort of supplies it needs in which amount.
b. Budgeting and Planning: UNICEF conforms the amount and time for the required budget and its funding resources. Orders are then placed and made sure when and where they arrive.
c. Procurement: Procurement is the major action of purchasing needed products at right price of high quality. A competitive tendering process, smart contracting and innovative funding tools are used.
d. Delivery and Clearance: Purchased products are transported from UNICEF warehouses to the target places over the world and customs clearance is done.
e. Inspection: Goods are thoroughly inspected related to amount, quantity and quality.
f. Warehousing, distribution and re-order: Goods are transported to the country-based warehouses and then to the end-users through in-country channels.
g. Utilization by end-users: Goods are distributed to the beneficiaries according to the requirement of implementation program.
h. Monitoring and evaluation: Actions are timely monitored regarding the distribution of goods and actions are evaluated through feedback for better result in upcoming days. (UNICEF, 2013.)

3.4 Challenges of Supply Chain in Nepal

Nepal promptly started to receive sympathies from around the globe and many countries sent disaster rescue groups to Nepal. The USA, India, the UK, Australia, Pakistan, Malaysia and Israel were the efficient supporters who sent groups of rescue experts within a day or two. In addition to the rescue operation, their aiding assurance for current help and future national rebuilding were warmly welcomed by the Nepalese. The aid assurance is counted in billions of US dollar. (Time, 2015)

Due to the socio-political situation and geographical complexity in Nepal, the aid program was not boosted in a rate as it should have been. The first hurdle on

humanitarian supply chain occurred at Nepal's one and only international airport, Tribhuvan International Airport (TIA). TIA has already been facing a lot of criticisms regarding its internal and external airport management. Moreover, its slender warehousing in customs department and limited parking area for airplanes caused an airport traffic problem. Additional international aircrafts which were carrying relief materials and rescue groups could not land in time and the material which had already arrived, were held for several days in customs (RTE News, 2015). Second dispute aroused when relief beneficiaries realised unrelated products from foreign donors. Some of them were tuna fish, mayonnaise and worn out clothes when, people were expecting to get grains, salt and sugar (The Guardian, 2015).

The geographical complications in Nepal is another challenge for smooth transportation. A large part of the country is covered by hundreds of meters of high hills and mountains. Many rural villages are set up on sloppy landscape having limited connection with basic infrastructures such as road and electricity. The places which are linked with roads are also underdone, unfinished and non-engineered. The transportation became worse due to the plight of earthquakes where continuous landslides and floods blocked some roads and wiped out villages.

A completion of a supply chain also depends upon the authorities responsible for the supply of goods. Nepal has been struggling in this case because of the insatiable politics and immoral practices of bureaucracy. Greediness, nepotism and favouritism are the three pillars of current hollow politics in Nepal. The rising example of this situation is seen on the distribution of relief materials. Some of the local political leaders authorised to deliver corrugated zinc sheets to victims were found charging money from beneficiaries.

4 AID AND RELIEF MOBILIZATION

4.1 National and International Aid

International communities and Nepalese both living in Nepal and diaspora gave a substantial support on aid collection for earthquake victims. National initiatives who were also active for other humanitarian activities earlier, were pioneering for relief activities locally. Some young Nepalese were volunteering to collect donations to buy basic goods of survival including rice, fast-foods, lentils and tents. Nepalese who have currently been living abroad were actively donating to the local and international humanitarian organizations for example: Red Cross, UNICEF, Save the Children and to locally active, Help Nepal Network and Bibeksheel Nepali Party. Financially unable people sent their moral support through social media networks.

Governmental relief mission of Nepal, Prime Minister's Disaster Relief Fund is currently in action which is accepting donations from all national and international sources in order to utilize it in a practical and effective way. As retrieved on October 9, 2015, the fund has collected 13,678,440,957 Nepali Rupees (NRS) already i.e. US $ 131,662,729.39 (As per US dollar to Nepali Rupees the exchange rate set by Nepal Rastra Bank dated 9.10.2015 which is, 1 US $ = 103.89 NRS) from which 12,401,600,000 NRS (US $119,372,413.12) has been dispatched for relief operation. The collection is still on going and expected to exceed. Main funders for the Prime Minister's Disaster Relief Fund are major governmental funded banks, governmental authorities, commercial banks, renowned business tycoons, industries, individuals, personal collection from governmental personnel and other foreign countries. (Prime Minister's Disaster Relief Fund, Nepal, 2015.)

The international response of donating and funding the government of Nepal is also significant. Countries with whom Nepal has a good diplomatic relation for many years, have promised to help on current aid programs and recovery operations in future. The initial international response for funding from international governments, organization and the governmental union funding is listed below:

TABLE 1. Donors and their donation assurance to Nepal. *Taken from CNN Money, 2015*

Donors	***Description***
United Nations	*US $15 million to be released from UN emergency fund.*
United States	*US $10 million to be funded for recovery purposes.*
Japan	*Japanese Yen 1 billion (US $ 8.4 million) grant with rescue troops.*
United Kingdom	*Aid package of British £5 million (US $7.6 million) where, £3 million to use immediately and rest to be donated to British Red Cross.*
Canada	*Canadian $5 million (US $4.1 million)*
Norway	*Norwegian Kroner 30 million (US $3.9 million)*
Australia	*Australian $5 million (US $3.9 million)*
European Commission	*European €3 million (US $ 3.3 million)*

Table 1 is the depiction of donation assured by major international communities intended to the relief for earthquake victims in Nepal. As shown above, The United Nations and the United States are the biggest donors assuring more than 10 million USD for the good of Nepal. The contribution of other countries are also noteworthy.

At an International Donor's Conference held in Nepal dated June 25, 2015, many international donors promised additional funding regarding earthquake recovery. India promised to provide US $1 billion, $500 million from China and $600 million from Asian Development Bank. Countries who already had promised to provide funding including Japan, the United States and the European Union also announced to make additional donations. The government of Nepal assured donors the rightful use of donation in needy areas. (BBC, 2015.)

International organizations who have long and direct relation to Nepalese community also announced to support from their level. Western Union which is one of the major global payment services and vastly operated in Nepal for transferring international remittance, announced to waive service fees in various countries for the payments destined to Nepal. It also assured to donate additional US $200,000 for NGOs working for earthquake recovery in Nepal (Western Union, 2015). Moreover, renowned social networking website facebook.com stated to collect donations from its users worldwide

for victims in Nepal on behalf of International Medical Corps. Over 750,000 Facebook users around the world raised over US $17 million. Facebook itself donated additional of $2 million for earthquake recovery purpose (Facebook, 2015).

4.2 Rescue and Relief operation

As soon as the news of the first big earthquake April spread all over the globe, several international governments promptly started to address the subject, sympathized and deployed their special disaster rescue forces to Nepal. Israel and India were the first nations to arrive in Nepal for rescue operation. In following days, China, Pakistan, the USA, France, the UK, Australia and Malaysia also sent rescue and relief teams who liberated trapped dead bodies, rescued people alive and arranged shelters for victims with the collaboration of national security forces of Nepal. A man named Rishi Khanal was rescued from ruins after 82 hours of being trapped by the collaboration of French rescue team and Armed Police Force of Nepal (CNN, 2015).

In the following days, the rescue mission was also widened to the rural areas. As the transportation by road was not possible because of the floods and landslides, international rescue troops came up with helicopters and continued their mission collaborating with Nepal Army. The government of India had launched a rescue operation named “Operation Maitri” which included 12 heavy duty military aircrafts and 18 helicopters with many rescue operators. They succeeded to evacuate more than 5,400 people from various earthquake affected areas. (The Times of India, 2015.)

The rescue mission also reached in Mount Everest where, mountaineers were struck by an avalanche and had taken 19 lives already in the Basecamp. Injured, stuck climbers and dead bodies were evacuated through helicopters even in the harsh weather conditions (National Geographic, 2015). In the course of relief operation, a miserable accident happened when a United States military helicopter did vanish with eight people on board. Six of them were from the US Marine and two were representing Nepal Army. The helicopter was found crashed in a hill after some days taking all eight lives (Time, 2015).

International flights including Indian Airlines, Air India, IndiGo and Spicejet which used to have daily flights from various parts of India to Kathmandu, halted for several hours because of the earthquakes. They decided later to have additional flights to Kathmandu to fly out stranded Indian visitors and also carry relief materials to Nepal without additional charges. (The Financial Express, 2015.)

4.3 Challenges in rescue and relief operation

In the period of rescuing victims and supply and delivery of relief materials, public, rescue troops, and various other authorities had to face different kinds of problems.

a. Access problems

Tribhuvan International Airport (TIA) located in Kathmandu is the one and only international airport in Nepal. It has just one runway for international flights and can hold only 9 taxing airplanes at the same time (The Kathmandu Post, 2015). It caused problems for international aircrafts who tried to land in TIA carrying earthquake relief materials and rescue personnel. After the crowd of airplanes began to rise, government of Nepal had to reject some international proposes to help Nepal. On the other hand, hilly and sloppy areas of rural Nepal were creating complications in rescuing and supplying survival goods through helicopters. For this reason, some aircraft supports were postponed for some days. (Yle & Skynews, 2015.)

b. Problems in logistics and distribution

Even in a critical aftermath of earthquake, unsystematic and biased distribution of relief materials caused a huge disappointment. The local distribution authorities who were obliged to distribute food and corrugated zinc sheets to victims tried to bias on delivery. It left a negative impression among donors because of unplanned and unmanaged allotting (Southasia, 2015). The large amount of food, survival kits, tents and other various medicines started to show up in local retail shops. A further police investigation later unfolded the involvement of some political leaders (Myrepublica, 2015). Some local leaders were found charging money from beneficiaries for donated items (The Himalayan Times, 2015). On other hand, the government of Nepal itself

delayed distributing relief goods for rural areas which were the neediest. The unresponsive behaviour of government steered street protests by unsatisfied groups in various areas (Deutsche Welle, 2015).

c. Uncooperative international media

Insensitive activities done by international media in such a tragic and pulsating period caused a huge criticism in Nepal. Indian media personnel who were in Nepal to cover news from locals were accused of acting unresponsive with victims and making disastrous situation sensational for their own professional good. It led a condemnation through social networking website facebook.com and micro blogging website twitter.com with the hash tag topic "#GoHomeIndianMedia". Slowly, it started trending also in India and Indian website users also started to support Nepalese on this issue. (CNN, 2015.)

d. Unacceptable behaviour of international donor

World Food Program (WFP) is one of the major donors in Nepal, helping in rural areas as well as on disastrous catastrophes. Though after the earthquakes, their donated rice to earthquake victims was found already spoiled. It also caused a huge public criticism. As a response to the public objection, John Ging, Director of Humanitarian Affairs WFP cautioned Nepalese to stop making news regarding food or they will divert their missions to Iraq and Syria (Southasia, 2015). WFP later decided to make an investigation team to find out reasons of 485 bags spoiled food (WFP, 2015).

5 SUSTAINABLE RECONSTRUCTION

5.1 Destruction from the earthquakes of 2015

The 7.8 magnitude recorded earthquake in Nepal was powerful enough to cause a mass destruction in a country like Nepal which has a diverse geographical state. Since, Nepal had not experienced such a big earthquake since 1934, people were less prepared for the consequences of such natural calamity.

The epicentre of the first earthquake hit was Gorkha District which lays on north-east Nepal and near to the Kathmandu valley. Along with the neighbouring districts to Gorkha, the earthquake caused huge demolition of houses in Kathmandu valley too. Many historical temples and palaces made by various dynasties in around 17th to 18th century in every three districts of Kathmandu valley, Kathmandu, Bhaktapur and Lalitpur turned to rubble. Those were the heritages which used to attract a huge number of local and international tourists and had religious and cultural values for Hindus and Buddhists.

Villages which were mostly in hilly areas had a vast amount of destruction. Houses particularly made of stones and wood could not stand the quake. The earthquake at the same moment, caused dry landslides in some sloppy areas which demolished houses and fertilized land swept away. Many victims from rural areas died because of being trapped between stone masonries. There are now 530,502 houses completely and 281,598 houses partially destroyed as updated on October 10, 2015. (Nepal Disaster Risk Reduction Portal, 2015)

On May 24, in Myagdi district of Eastern Nepal, an entire hill fell off blocking Kaligandaki River and drowned a surrounding village. The rocky hill was loosened because of the continuous shakes of aftershocks. However, no casualties happened because of timely evacuation and the river itself managed to overflow some hours later (Ekantipur, 2015). Another tragedy befell in Taplejung district, when a heavy rainfall triggered a huge landslide from a loosened hill on June 11, 2015. The landslide swept away entire village claiming 53 lives and injuring 12 people this time (Ekantipur, 2015.)

5.2 Traditional house and infrastructure construction model

According to the research, the main cause of destruction is a model of houses that Nepalese have been building for years. There are mostly non-engineered houses in Nepal. People living in countryside have been making stone masonry buildings because, stones are found easily from nature. People carve them by hand and build houses mixing with either mud or concrete mortar. Trees are still famous for pillars, beams and for the frame of windows and doors. Thin stone plates are used to build roofs. Usually, those houses are constructed by local masons who have skills from experience without a formal training. Still in some parts of rural Nepal, financially poor people prefer to make houses made by wooden components for example, wood, bamboos, dried bushes and thatch. These kinds of houses are financially economic but, generally not meant to resist high magnitude of earthquakes because of poor structure and joints. The thickness and heaviness of stone masonry is the main the cause of casualties. Wooden houses might be safe to live in but they also are less resistant to earthquakes. (Lutman, 2015.)

Many of the ancient heritages in Kathmandu valley were built in 5th to 7th century by various dynasties. They were continuously renovated by subsequent rulers keeping traditional elegance intact. Those temples were made using handcrafted bricks, handmade wooden parts which had various designs embossed, and big stone blocks (Bonapace & Sestini, 2003). The vast destruction on those heritages raised a question on their earthquake resistance.

These days in urban areas, two varieties of concrete based buildings can be seen, buildings made of bricks with concrete mortar but without pillar and buildings made of bricks and concrete mortar with pillars. First kind of building is called unconfined masonry and second is called reinforced concrete model having bricks infill (Okazaki, et al., 2012). Both kinds of buildings are mostly non-engineered thus, not resilient to the earthquakes.

5.3 Earthquake resistant construction model

Every year, thousands of people lose their lives in earthquakes and face huge destruction of infrastructures in most densely populated cities around the globe. It is said that the disasters themselves are not reasons of casualties but, the infrastructures which cannot stand certain level of quakes are. Nepal is the most current example of these circumstances where, thousands of people died just because of fallen houses.

Natural disasters are inevitable. Controlling those is not in the hands of human. The only way to safeguard people is to become timely aware and follow building methods of earthquake resistant houses. It is more important in the context of Nepal which has high geographical risk because of massive hills, overcrowded cities and rural villages having poorly made houses.

On the day of April earthquake, both people who were frightened and lost their houses had a complex living in open air. Their lives were at risk of starvation and epidemics caused by poor hygiene. Some volunteers started delivering tents to the groups of victims. In following days, they also made tent-like shelters made of bricks and corrugated zinc sheets for the homeless. Though, this practice is just for a short period of time.

Nepal is still on the risk of recurring similar or even bigger magnitude of earthquakes. Now this time the result of an earthquake can be worse because of cracked houses and non-engineered temporary buildings. To prevent further infrastructural damage, habitats need to repair current buildings to make them earthquake resistant or build new houses following earthquake resistant building codes issued by the government of Nepal.

Particularly, there are three possibilities of earthquake resistance habitation from the side of socio-economic standard of average Nepalese at this moment.

a. Cost-friendly houses made wood, bamboos, stones, thatch and clay.
b. Retrofitting partially cracked houses by repairing frames and pillars to make earthquake resistant.
c. Making new earthquake resistant house.

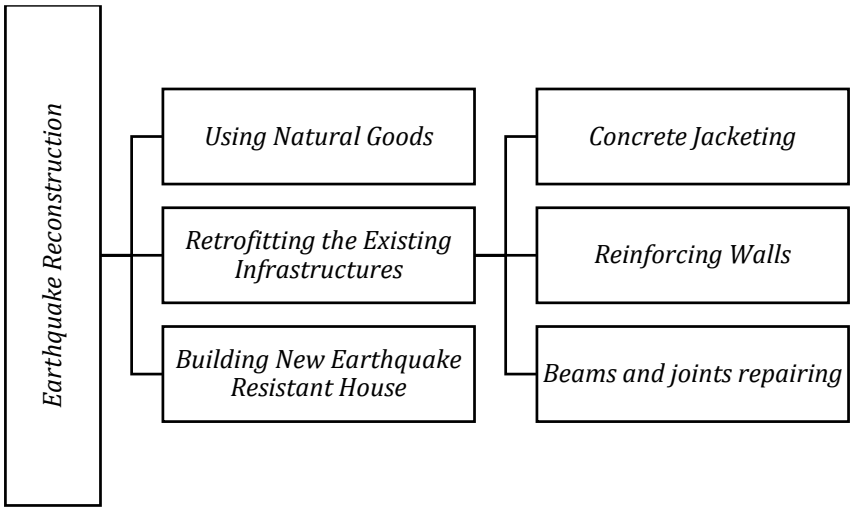

FIGURE 6. The general model of earthquake resistant reconstruction in Nepalese scenario.

As shown in Figure 6, the first idea of making houses using naturally available goods is the most economical way which reduces the costs of construction. Due to the geographical and climatic variety, nature has given a lot to Nepal. These resources can be used in making a cost-friendly shelter. Houses made of bamboos and wood may be a good option for reducing earthquake-based damages because of its flexibility and lightness.

However, houses made of naturally available materials might be just temporary solutions. They can be cost-effective to make and will probably reduce the rate of casualties but, are not made of following earthquake resistance tools (Deutsche Welle, 2015). These types of houses are preferred to be used as temporary shelters for a certain period of time. For the permanent security, retrofitting the house or making new earthquake resistant house is better.

Retrofitting a house is possibly a better and reliable way to make houses stronger. In case, houses are not earthquake resistant and fairly cracked during earthquakes, they can be repaired. The purpose of retrofitting is to create a structural safety. It includes bracing of pillars and joints and wall reinforcing to make houses earthquake resilient.

Retrofitting has various forms such as, concrete jacketing on pillars, reinforcing frames and reinforced foundation. Concrete jacketing in existing buildings is a basic cost-

effective idea where, concrete pillars are bounded by steel rods. In the process, concrete pillars are drilled vertically, and jacketed through the layers of steel rods.

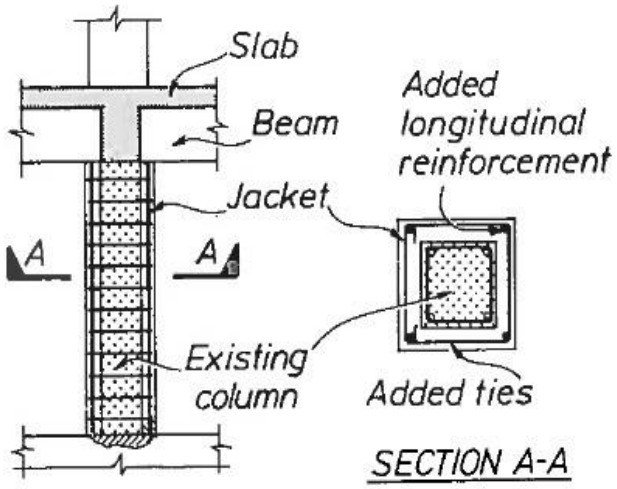

FIGURE 7. An illustration of Concrete Jacketing. *(Adapted from Repair and Strengthening of Reinforced Concrete Buildings for Seismic Resistance, M. Rodriguez, M. Eeri, R. Park, 1991)*

The left-hand side of illustration of Figure 7 is a reinforced concrete pillar which is jacketed by the rows of steel rods. The pillar is drilled around maintaining certain distance and rods are installed. This sort of jacketing is expected to expand the resistance of pillars increasing flexibility (Rodriguez, et al., 1991). In major cities of Nepal where buildings are of concrete pillars and brick masonry, jacketing is a better option to secure them.

Same as the pillars, walls are also vulnerable to the seismic tremors. Following the global trend and guidelines of wall reinforcing issued by National Society of Earthquake Technology Nepal (NSET), brick and stone masonries which are cracked, can be repaired by various methods depending on their size and nature. Mild cracks on concrete walls can easily be filled by epoxy injection. It is the process of injecting resin inside the cracks through a pump and covering it by concrete filling. In case cracks are relatively bigger and diagonal, it is better to remove loose bricks or stones and repair walls adding new stones or bricks supported with steel bars and rich concrete. These

walls can be repaired from both sides when needed. Walls are jacketed by welded steel nets with concrete filling in both sides while repairing. (Ali & NSET, 2009.)

FIGURE 8. A demonstration of wall jacketing by welded steel net. *(Adapted from NSET)*

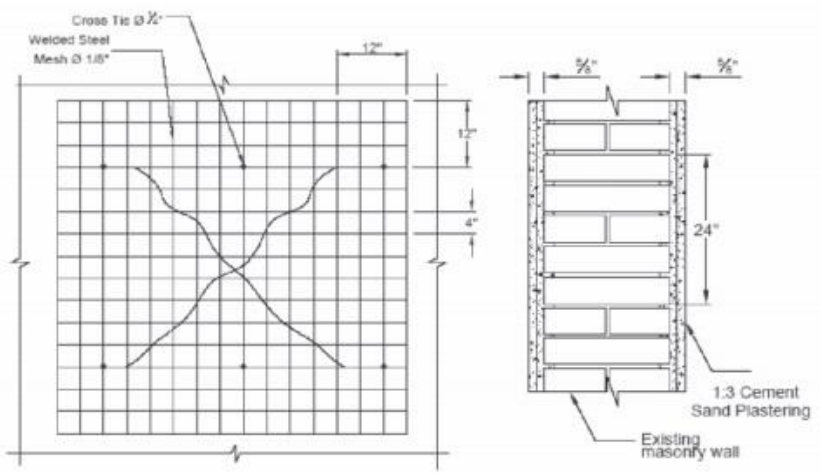

FIGURE 9. An illustration of steel net jacketing with concrete filling. *(Adapted from Seismic Retrofitting and Repair Manual for Buildings; Ali, Qaisar)*

Above given Figure 8 and 9 are examples of wall jacketing for earthquake resistance reinforcement. The first Figure 8 shows how weaker or cracked walls are removed and welded steel nets are put. Those nets are going to be filled by rich concrete later. The second Figure 9 is a guideline of wall jacketing over cracked wall. Both illustrations are good sources for Nepali urban housing reinforcement.

In concrete and brick masonry, structural defects are found also in pillar joints and beams. If pillars are not efficiently hooped with a wall, it turns out to be weaker afterwards. To get rid of this, joints where pillars and beams meet, steel rods should be merged effectively so that it can hold the weight of both pillar and beam. The origin of

wall cracking is found normally from window assembly. Windows can be reinforced by placing long concrete or wood bar on both up and down of windows and tying them with pillars nicely. This process is called Sill and Lintel Banding and is very effective to reduce wall cracking starting from windows. (NSET-Nepal, OFDA/USAID, UNESCO Kathmandu, 2002.) These are the repairing features for houses which are fairly cracked. Though, the maintenance should be done following governmental guidelines and only by experienced architectures and masons.

The Government of Nepal, Department of Urban Development and Building Construction has published building codes for new earthquake resistant housings. These codes are written by experienced engineers after researching the landscapes of several parts in Nepal and current trends of making housings both in rural and urban areas. These building rules are specified both for Reinforced Concrete and cost-effective houses made of stone or bricks with mud mortar.

Before the foundation, the building code suggests to calculate width and length of building to make symmetrical because, geometrically symmetric buildings are found comparatively safer. Width to length ratio should not exceed 1:3 both calculated inside and outside. It also applies on the size of each room. Floor to floor height should not be less than 1.8 meter and not greater than 2.5 meter. The size and level of foundation trench and foundation bed should be equal in each part. In case a building is founded on sloppy land, land should not be steepened by more than 20°. Steel rods are to be joined with baseline of steels effectively using steel rings for better joints of pillars to base.

In case of mud wall construction, mud should be pure without the contamination of non-organic material and should neither be dry nor excessive moist. However, a certain amount of water is suggested to be used for workability while in construction. After completion of maximum 300 millimetres of layer, it is better to be left for 2 to 4 days covering it to secure from direct sunlight. For better strength of wall, bamboos can be put vertically and horizontally on walls.

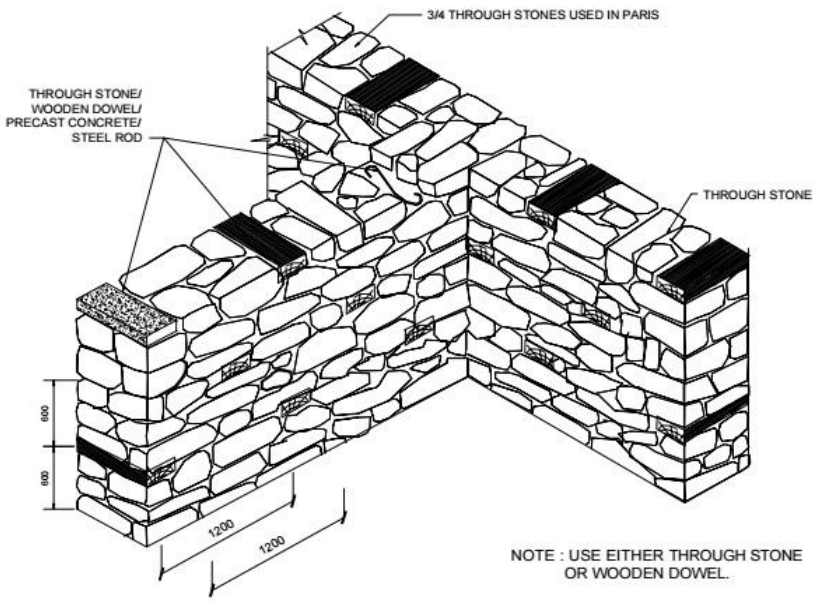

FIGURE 10. Using of stones and wooden dowels in stone walls. (*Adapted from Guidelines for Earthquake Resistant Buildings, Department of Urban Development and Building Construction, Nepal, 1994*

As in Figure 10, only flat stones are suggested to be used on having 10 to 20 mm of mud mortar thickness if it is a stone wall. A wall should contain through-stones and wooden dowels occasionally. Big and flat stones should be placed on joints. Same applies for brick masonry with concrete mortar.

Corners and joints are usually vulnerable on every mud, stone and brick masonries. To reinforce mud masonries, bamboos or timbers can be place vertically and horizontally to the corners where, big, flat, and through-stones should be placed in stone masonries to hold both walls. In concrete buildings both beams should be joined efficiently using steel rings.

The combination of both wall and door should not exceed 35 % of total length of wall in one storeyed building, 25 % in two storeyed and 20 % in three storeyed building. It is suggested the doors and windows should not be put in corners or junctions. Vertical distance between a door and a window should not be less than 60 cm or half of the width of window whichever is greater. For the better grip of windows and doors to wall, Sill and Lintel Banding is essential.

Beams are put in between pillars and roof which gives support to the frame of roof. Though, beams should not directly be rested on walls. A pad made of stone or wood

should be between beam and pillar. The pad should be minimum of 75 mm thick. In traditional houses, wooden or bamboo joists are famous as roof frames but, they must be nailed or joined properly with each other. Bamboos are flexible to hold earthquakes and sawed timbers are also good in account of their lightless.

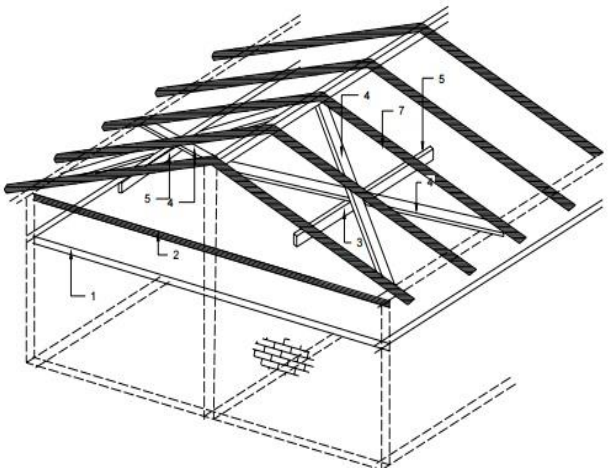

FIGURE 11. Diagonal bracing of joist and rafters. *Adapted from Guidelines for Earthquake Resistant Buildings, Department of Urban Development and Building Construction, Nepal, 1994*

Figure 11 shows a typical Nepali style of house having diagonally placed joists which are nailed with beams and rafters. Roofing materials are put over the joists. Talking about various roofing materials used in Nepal, well-burnt curvy tiles have been preferred in the Terai region for many years. In hill-side Nepal, corrugated zinc sheets are famous because of low-costs and lightness. Concrete roofing is another much used trend for Reinforced Concrete buildings in urban areas. For every sort of roofing, it is essential to confirm the capacity of pillars and beams to hold the weight of roof and the grip of roof with rafters. A better grip of various parts with each other develops earthquake resistance on buildings. (Department of Urban Development and Building Construction, Nepal, 1994.)

After completing the house construction, there are some small tips which seem minor but are important for security in earthquakes. First thing to be considered is to have a proper drainage and pipeline system in houses because leakage on drainage or pipeline can cause building foundation weaker and finally, entire building collapses. If flower

pots or water tanks are put on attics, they should be braced properly in order to protect them from falling and causing harm to the people on ground. Same applies for potentially harmful products inside home such as gas cylinders, kerosene or other flammable goods. (Department of Urban Development and Building Construction, 1994.)

Nripal Adhikary, the founder of Abari Group has introduced a cost-friendly model of earthquake resistant home following building guidelines published by Department of Urban Development and Building Construction, Nepal. The house is prepared using red clay, stones, bamboo, and tiles of red clay as roof. Clay is especially used in walls and the joists and rafters are made of bamboos. Bamboos are a good choice because of its flexibility. Considering the transportation problem because of geographical complexity in Nepal and average Nepali's economic standard, it would be a rational choice to mobilize easily available goods to build earthquake resistant houses. (Adhikary, 2015.)

5.4 Role of people, government and other parties

In the sense of time and money, repairing a general size house costs less than establishing a whole new one. Owners whose houses are cracked can repair them following above stated guidelines published by governmental authorities at a fairly low cost. It is reasonable because a large part of population are already below the poverty line in Nepal. Excluding the voluntary actions of organizations like Help Nepal Network, house reinforcements from an owner's pocket are a huge financial issue. Nepalese who were not aware about building earthquake resistant building made of naturally available materials, it is the right time for them to read governmental instructions and follow thoroughly.

Pranav Bhattarai writes on Nepali online magazine, The Rising Nepal, "…disaster not only brings devastation but also offers lessons and opportunities to make corrections of the mistakes that have been made." Even after the wide knowledge of hazardous natural state of Nepal, people were not seriously considering the risk of mass destruction from earthquakes. Now since it is clearly seen how dangerous it can be for a human, it is an opportunity for all to make steps against the destructive consequences

of seismic events. The government of Nepal regularly organizes campaigns for security measurements during earthquake and earthquake resistant housing building codes. Nepalese need to concern on those matters more and follow the guidelines while repairing or making their homes.

Bhim Udas, a retired United Nations official from Nepal has added his idea towards Government in a Nepali online news portal www.setopati.com in a topic of "Roadmap for rebuilding Nepal", to recall and mobilize efficient human resources which are currently living in abroad. He calls them as a crucial manpower for the reconstruction. Moreover, he has another approach to mobilize students which are currently obtaining practical or vocational studies to contribute to the rebuilding process as a part of their regular study. Keeping concurrent dissipated political practice and less capable bureaucracy in centre, the writer suggests to construct a responsible government with proficient ministers which goals to remove corruption and bureaucratic barriers from a regular restoration mission.

The Government of a particular country has an acute role during the disasters. It needs to take appropriate actions after visualizing the real condition. All the responsibilities for example, evacuation, rescue, health campaigns, distribution of survival kits and management of both temporary and permanent shelters fall under the pilot actions of a government. After the destruction of April earthquake, the government of Nepal deployed national security forces to rescue victims from ruins. Those forces collaborated with international rescue groups. Moreover, the Government has announced to provide NRS 15,000 for each homeless to build temporary shelters. It has been accepting national and international donations on Prime Minister's Disaster Relief Fund which will be utilized for aid and reconstruction purposes.

The Government of Nepal has purposed a program through Nepal Rastra Bank, the central bank of Nepal for major victims whose houses are entirely and partially destructed. The central bank has circulated an ordinance for commercial banks to approve loans to the victims at 2 % p.a. interest. To ensure the sufficiency of fund, Nepal Rastra Bank has decided to refinance banks and financial institutions at 0 % interest rate which is the first ever practice in Nepalese banking history. Loan-seekers should present collateral in exchange of loans and the basic approved loan amount would be

2.5 million NRS. It can be exceeded after complying additional terms and conditions. (Ekantipur, 2015.)

In the critical condition after the quakes, the role enacted by international donors and humanitarian organizations for Nepalese is highly considerable. The Government of Nepal prepared an international conference in Kathmandu on June 25, 2015 to discuss about reconstruction issues. Officials representing Nepal assured international donors about the transparency of funding and to a utilize fund in actual purpose. Countries and organizations for example India, China, Japan, the European Union and Asian Development Bank who have provided funds to Nepal, declared to donate and lend additional amounts. To give this purpose a practical shape, Nepal will build a special agency chaired by the Prime minister who will delegate actions to various authorities. The new department will be responsible for the reconstruction issues including procurement of equipment, land and other environmental approvals. (The Wall Street Journal, 2015.)

Local Nepalese who are concerned to initiate humanitarian activities, are playing the role of a whistle-blower. National Civil Society Organization (CSO) has advised the Government of Nepal concerning international donors about their roles on humanitarian actions in Nepal. CSO suspects international donors for being deliberately hyper-influential and cutting down the roles of national organizations. It suggests international communities to walk hand in hand with local communities for reconstruction instead of acting alone. (Ekantipur, 2015.)

6 CASE ANALYSIS: PROBLEMS AND THE SOLUTION

Natural disasters are inevitable. They can only be presumed but cannot be declared for a specific time and date. So, the best thing people can do for safety is to take precautions in advance. People in Nepal were definite about earthquake recurrence but, were less prepared. After continuous earthquakes, April and following months were full of complexities for Nepalese. They had lost their houses, shortage of food was mounting and the Government of Nepal was continuously failing to address the victim's problems. Not only because of earthquakes but, other external causes were equally helping to create a worse-case scenario.

a. Biased relief distribution

It was heart-breaking that some relief material distribution authorities were bias on political and social backgrounds while delivering materials at a local level (Amnesty International, 2015). Some retail shop owners caught hiding corrugated zinc sheets who were deliberately charging a high price.

b. Complicated political scenario

The earthquake hit Nepal in a period when it was progressing to create a new constitution through Constitution Assembly (CA). It was already the 8th year running since the commencement of CA. Because of the absence of constitution, political conditions were vulnerable. The consequence of constitutional absence was clearly seen on inadequate readiness for the earthquake safety.

The Constitution Assembly promulgated the new Constitution of Nepal on September 20, 2015 addressing the voices of the majority of Nepalese. Unfortunately, an unsatisfied group of people living on Terai region shot riots against Government claiming not addressing their topics on the new constitution which was to establish a new state in their area. Worse than that, the Government of India publicized press notices suggesting to discourse with rioting groups. Indian government later shut borders with Nepal when the situation in Terai became more violent. It stopped selling gasoline to Nepal and paused the supply of goods to Nepal. It was an "undeclared Indian

embargo to Nepal" as stated by experts. Dealing against these various political instabilities, earthquake related topics are dimmed in shades. (Setopati, 2015.)

c. The paradox of governmental fund raising

The decision made by the Government of Nepal to route all international funds and rights of allocation to the Prime Minister's Disaster Relief Fund has got many different reactions from public and intellectuals. They suspect the possibility of mishandling of funds. Though the secretary of Prime Minister's Disaster Relief Fund, Mr. Narayan Gopal Malego insists in a statement that "one-window service" will try to consolidate the amount, avoid duplication of the effort and ensure proportional and equitable distribution of funds to the victims. However, renowned Nepali Journalist, Kunda Dixit gives a slightly different view on the role of Non-governmental Organizations (NGOs) that already registered NGOs working on earthquake related activities in Nepal can have its own funding for the actions. Both ideas of fund mobilization through the Government and NGOs are not fully free from the conflicts because they both have dark sides of fund management. (ReliefWeb, 2015.)

Nepalese themselves who are financially able can contribute to the victims in many ways. A good example of giving away from people to people can be an integrated community house construction. A Nepali television performer couple Sitaram Kattel and Kunjana Ghimire have made a community home in Kavrepalanchowk district. It was made after the continuous effort of 70 days which has 40 integrated homes for earthquake victims. This effort is highly appreciated by ministerial secretaries, political leaders and general public. The couple has also built seven class rooms for primary school in Nuwakot district. This would be a good way to show the Government and donors the correct usage of funds. (The Kathmandu Post, 2015.)

Help Nepal Network (HeNN Nepal) is another good example of philanthropic actions from a Nepali non-profit organization. The organization which is principally founded by a well-known persona Rabindra Mishra, the producer journalist from British Broadcasting Corporation Nepal (BBC Nepali), collects donations globally through charity activities. The primary goal of HeNN Nepal is to utilize funds in the field of health and education on deprived sectors in Nepal. After the earthquake, it has

enlarged its mission to distribute survival kits, to help reconstructing houses and reside homeless people. (Help Nepal Network, 2015.)

The organizational formations of both examples are functionally different but, the vision is similar which is to give fellow Nepalese better lives through securing housing and allowing children the basics of education. Additionally, mass construction of infrastructures highly utilizes natural sources and generates employment for skilled manpower. This is more important also for the mobilization of abandoning youths in better workplaces.

At this moment, the Government is busy solving political matters, people are under the shortage of food and petroleum and NGOs/INGOs have not got the right environment for participation. In this situation, the Government is responsible for defining roles, areas of actions and limitations for every related parties. For the Government, the first task now would be to demolish potentially harmful cracked buildings either they are temples, skyscrapers or school. It will reduce the risk of casualties by noticeable amount in case of upcoming quakes. Another important subject for the Government is to prioritize its tasks first whether it is to address the questions of rioting group or collapsing cracked houses or to build news houses as it has very limited time and fund available.

Transparency of a fund is equally important as the right utilization of fund is. Both the Government of Nepal and INGOs/NGOs have been constantly facing criticisms from people about transparency of their fund utilization. Giving donors or related parties the factual information about their donation mobilization fall under the major responsibilities of every donation collectors. Only a transparent activity can gain the trust of donors and beneficiaries. Moreover, victims who still are struggling for better shelters and food availability, have a right to claim for basic needs of survival from the Government. In the meantime, they should keep patience, positivity and fraternity among fellow Nepalese to keep peace on the nation.

7 CONCLUSION

April earthquakes and aftershocks have caused very serious conditions in every social and economic field in Nepal. Victims have been going through a complicated life with unreliable accommodation and uncertain future. They are frightened of the situation where if a similar or even a bigger earthquake occurs. Victims have lost the right to get the basics of survival even in such a vulnerable period of time. For this, many internal and external causes are liable. Though, many national and international organizations served Nepalese with empathy and selflessness. Citizens from around the earth donated money through various international humanitarian organizations, many countries themselves donated money and survival kits and got involved in rescue operations. In the meantime, NGOs and INGOs volunteered to rescue and protect the victims from epidemics. It was such a huge humanitarian collaboration of people which put vicious aftermath of earthquake in shade.

Nepal has now a big challenge ahead to efficiently utilize the fund and imply the duty of reconstruction crossing over the mounting economic and political issues. The Government of Nepal has collected a huge amount of donations from national and international sources with the purpose to aid and enable victims with a better life where, national and international humanitarian organizations are also doing the same on the community. Now it is more important for the government to find a way to manage funds and team up with every related party Considering these positive and negative aspects of the earthquakes occurred from April 25, 2015 in Nepal, the main goal was to go through aid and relief mobilization process led by humanitarian organizations and find out concurrent problems and solutions on the recovery of victims through a better accommodation.

This thesis is an attempt of discovering aid and relief actions done especially by international communities in Nepal after the earthquakes of April 2015. In addition to the monetary data, it has also tried to understand their supply processes to discover how their supply chain generally works while in humanitarian actions. It is the one important act for beneficiaries and donors to understand how their donations and aids are processed. After discussing through the aspects of aid and relief, another hot topic

is how the Government of Nepal will deal with reconstruction processes for victims in-between the political and management challenges. After researching current Nepali scenarios closely, this thesis has concluded some better and efficient ways for building earthquake resistant houses in which, every related actor can collaborate responsively and give their valuable effort from his level. The thesis sees a better and secure future only from the cooperation led by the responsible Government and authorities.

This thesis is more than just a research. It is a small guideline to the responsible parties for practical ways of aid mobilization and earthquake reconstruction. Since it is written after visualizing the diverse natural, economic and socio-political conditions especially in current Nepal, it is expected to be more associated with the common feelings of the Nepalese. The data and information in this thesis are extracted from the reliable sources published by national and international organizations and online magazines. The grounds of information are basically eBooks, news, electronic magazines and expert views.

Since this thesis was written mainly as a desk research following qualitative techniques of writing, it reserves the limitation on the validity of information. Statistics and information extracted from news sources might be updated in near future because, the case of April earthquake was very recent at the moment of commencement of this thesis. It suggests future thesis writers who are picking similar topics to go through updated sources for the valid statistics.

Finally, this thesis expects to create a milestone both for Nepal and other developing countries who have similar issues of natural catastrophes. It is a suggestion for every government, citizen, humanitarian organization and whistle-blower to act responsively in advance in order to create a better safeguard for people from unpredictable natural catastrophes like earthquakes as prevention is better than cure.

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